

454 Instant Adhesive



Product Description

LOCTITE® 454™ provides the following product characteristics:

Technology	Cyanoacrylate
Chemical Type	Ethyl cyanoacrylate
Appearance (uncured)	Clear to slightly cloudy gel ^{LMS}
Components	One part – requires no mixing
Viscosity	High, thixotropic
Cure	Humidity
Application	Bonding
Key Substrates	Metals, plastics and elastomers

This Technical Data Sheet is valid for LOCTITE® 454™ manufactured from the dates outlined in the 'Manufacturing Date Reference' section.

LOCTITE® 454™ is designed for the assembly of difficult-to-bond materials which require uniform stress distribution and strong tension and/or shear strength. The product provides rapid bonding of a wide range of materials, including metals, plastics and elastomers. The gel consistency prevents adhesive flow even on vertical surfaces. LOCTITE® 454™ is also suited for bonding porous materials such as wood, paper, leather and fabric.

NSF International

Registered to NSF Category P1 for use as a sealant where there is no possibility of food contact in and around food processing areas. **Note:** This is a regional approval. Please contact your local Technical Service Center for more information and clarification.

Typical Properties of Uncured Material

Specific Gravity @ +25°C: 1.1

Flash Point: see SDS

Casson Viscosity, +25°C, mPa·s (cP):

Cone and plate rheometer – 150 to 450LMS

Viscosity, Brookfield – RVT, +25°C, mPa·s (cP):

Spindle TC, speed 2.5 rpm, helipath

*100,000 to 300,000LMS

Spindle TC, speed 20 rpm, helipath

*18,000 to 40,000LMS

*Applies to material made in N. America

Typical Curing Performance

Under normal conditions, the atmospheric moisture initiates the curing process. Although full functional strength is developed in a relatively short time, curing continues for at least 24 hours before full chemical/solvent resistance is developed.

Cure Speed vs Substrate

The rate of cure will depend on the substrate used. The table below shows the fixture time achieved on different materials at +22°C / 50% relative humidity. This is defined as the time to develop a shear strength of 0.1 N/mm².

Fixture Time in Seconds:			
Steel	30 to 60	Wood (balsa)	<5
Aluminium	2 to 10	Wood (oak)	30 to 60
Neoprene	10 to 15	Wood (pine)	15 to 30
Rubber, nitrile	<5	Chipboard	5 to 10
ABS	<5	Fabric	10 to 20
PVC	5 to 10	Leather	5 to 15
Polycarbonate	10 to 15	Paper	5 to 10
Phenolic	<5		

Cure Speed vs Bond Gap

The rate of cure will depend on the bond line gap. Thin bond lines result in high cure speeds, increasing the bond gap will decrease the rate of cure.

Cure Speed vs Humidity

The rate of cure will depend on the ambient relative humidity. The best results are achieved when the relative humidity in the working environment is 40% to 60% at +22°C. Lower humidity leads to slower cure. Higher humidity accelerates it, but may impair the final strength of the bond.

Cure Speed vs Activator

Where cure speed is unacceptably long due to large gaps, applying activator to the surface will improve cure speed. However, this can reduce ultimate strength of the bond and therefore testing is recommended to confirm effect.

Typical Performance of Cured Material

Adhesive Properties

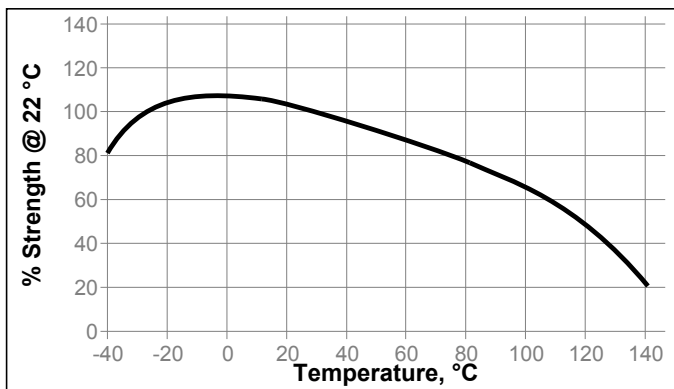
Cured for 30 seconds @ +22°C		
Tensile strength, ISO 6922	N/mm ²	psi
Buna-N	≥6.0 ^{LMS}	≥870
Cured for 72 hours @ +22°C		
Tensile strength, ISO 6922	N/mm ²	psi
Buna-N	15.1	2,190
Lap Shear Strength, ISO 4587		
	N/mm ²	psi
Steel (grit blasted)	20.9	3,030
Aluminum (etched)	17.1	2,480
Zinc dichromate	11.5	1,670
ABS	8.3	1,200
PVC	7.1	1,030
Phenolic	12.3	1,780
Nitrile	1.3	190
Neoprene	1.1	160
Block Shear Strength, ISO 13445		
	N/mm ²	psi
Polycarbonate	9.6	1,390
ABS	23.3	3,380
PVC	3.3	480
Phenolic	6.7	970

Typical Environmental Resistance

Cured for 1 week @ +22°C	
Lap Shear Strength, ISO 4587	Steel (grit blasted)

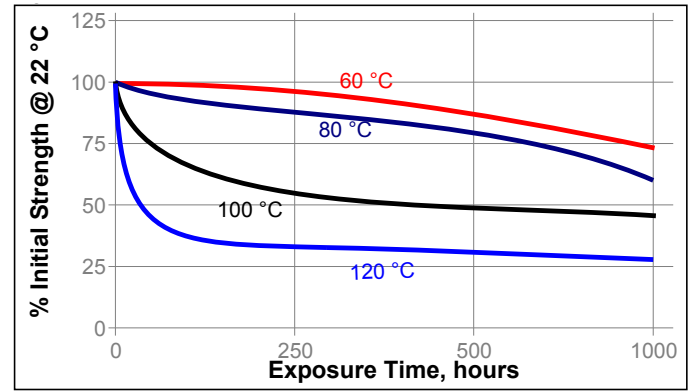
Hot Strength

Tested at temperature.



Heat Aging

Aged at temperature indicated and tested @ +22°C.



Chemical/Solvent Resistance

Aged under conditions indicated and tested @ +22°C.

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Motor oil	40	105	85	80
Unleaded gasoline	22	95	120	125
Water	22	75	70	75
Water/glycol	22	90	85	85
Ethanol	22	120	125	120
Isopropanol	22	100	130	135
98% RH	40	70	55	55

Chemical/Solvent Resistance

Aged under conditions indicated and tested @ +22°C

Lap shear strength, ISO 4587, polycarbonate

Environment	°C	% of initial strength		
		100 h	500 h	1000 h
Air	22	105	105	105
98% RH	40	105	105	105

General Information

This product is not recommended for use in pure oxygen and/or oxygen rich systems and should not be selected as a sealant for chlorine or other strong oxidizing materials. For safe handling information on this product, consult the Safety Data Sheet (SDS).

Directions for use:

- 1 Bond areas should be clean and free from grease. Clean all surfaces with a LOCTITE® cleaning solvent and allow to dry.
2. To improve bonding on low energy plastic surfaces, Loctite® Primer may be applied to the bond area. Avoid applying excess Primer. Allow the Primer to dry.
- 3 LOCTITE® Activator may be used if necessary. Apply it to one bond surface (do not apply activator to the primed surface where Primer is also used). Allow the Activator to dry.
- 4 Apply adhesive to one of the bond surfaces (do not apply the adhesive to the activated surface). Do not use items like tissue or a brush to spread the adhesive. Assemble the parts within a few seconds. The parts should be accurately located, as the short fixture time leaves little opportunity for adjustment.
- 5 LOCTITE® Activator can be used to cure fillets of product outside the bond area. Spray or drop the activator on the excess product.
- 6 Bonds should be held fixed or clamped until adhesive has fixtured.
- 7 Product should be allowed to develop full strength before subjecting to any service loads (typically 24 to 72 hours after assembly, depending on bond gap, materials and ambient conditions).

Loctite Material Specification^{LMS}

LMS dated December-22, 2011. Test reports for each batch are available for the indicated properties. LMS test reports include selected QC test parameters considered appropriate to specifications for customer use. Additionally, comprehensive controls are in place to assure product quality and consistency. Special customer specification requirements may be coordinated through Henkel Quality.

Storage

Store product in the unopened container in a dry location. Storage information may be indicated on the product container labelling.

Optimal Storage: +2°C to +8°C.

Storage below +2°C or greater than +8°C can adversely affect product properties.

Material removed from containers may be contaminated during use. Do not return product to the original container. Henkel Corporation cannot assume responsibility for product which has been contaminated or stored under conditions other than those previously indicated. If additional information is required, please contact your local Technical Service Centre or Customer Service Representative.